

Before the
Federal Communications Commission
Washington, DC, 20554

In the Matter of)	
)	
Connect America Fund)	WC Docket No. 10-90
)	
A National Broadband Plan for Our Future)	GN Docket No. 09-51
)	
Establishing Just and Reasonable Rates for Local Exchange Carriers)	WC Docket No. 07-135
)	
High-Cost Universal Service Support)	WC Docket No. 05-337
)	
Developing a Unified Intercarrier Compensation Regime)	CC Docket No. 01-92
)	
Federal-State Joint Board on Universal Service)	CC Docket No. 96-45
)	
Lifeline and Link-Up)	WC Docket No. 03-109
)	

COMMENTS OF PUBLIC KNOWLEDGE AND BENTON FOUNDATION

Harold Feld
Legal Director

John Bergmayer
Rashmi Rangnath
Sherwin Siy
Michael Weinberg
Staff Attorneys

Public Knowledge
1818 N St. NW
Suite 410
Washington DC, 20036

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EXECUTIVE SUMMARY

Public Knowledge and the Benton Foundation (“Commenters”) applaud the efforts by the Commission to provide broadband for rural communities and rationalize the intercarrier compensation (ICC) system. At the same time, however, the Commission cannot sacrifice the statutory mandate for *universal* service in the pursuit of these efforts. The Commission’s proposed means to shift the Universal Service Fund (USF) high-cost fund to the proposed Connect America Fund (CAF) threatens to sacrifice universality on the altar of fiscal control. The Commission’s proposal to rely on reverse auctions will likely leave some regions unserved, while simultaneously abandoning the requirement that a USF recipient serve all households in its service territory. This amounts to an implicit abandonment of the principle of true universal service. For the first time in FCC history, “universal” will come to mean “close enough.” While the President’s goal of reaching 98% of Americans with high speed wireless in the next five years is a useful goal, the Commission must regard it as adequate in the context of universal service reform.

Fortunately, the Commission can achieve both fiscal responsibility for the fund and true universal service by allowing local communities to self-provision. Communities should have the flexibility to leverage new wireless technologies, or the presence of anchor institutions sitting on fiber, to provide their own broadband networks. The Commission can facilitate this through two simple requirements. First, the Commission should require that any provider receiving USF funds interconnect with any requesting party in the area it serves or in a neighboring, unserved bid area. Second, the Commission should create a small fund modeled on the Technology Opportunity Fund (TOP)

previously administered by the National Telecommunications Information Administration (NTIA). Using this fund to seed local community broadband, and ensuring that these community networks can reach the broader Internet through mandatory interconnection, the Commission can harness the energy of rural communities to new broadband technologies to create truly universal broadband accessibility.

The Commission must also ensure that broadband funded by CAF provides meaningful access to the benefits identified in the National Broadband Plan (NBP). Accordingly, in addition to such metrics as speed and jitter, the Commission must prohibit abusive terms of service. The Commission should exclude from funding those providers with usage caps that effectively prevent customers from using applications and services such as streaming media or virtual private networks (VPNs). The Commission should also ensure that recipients offer services with clear terms of service, which also do not prioritize or degrade specific applications or content.

Finally, the Commission must carefully consider how to implement changes in the ICC in a manner consistent with maintaining rural service. The Commission should approach any phase out or substantial restructuring of ICC with caution, to avoid unintentional disruption in rural service. More importantly, the Commission should take this opportunity to establish its authority over Internet Protocol (IP) traffic, while declining to impose any specific regulations or framework. As traffic increasingly moves to IP networks, the Commission must remain in a position to ensure that critical services are not interrupted. At the same time, the Commission must recognize that it does not have a sufficient understanding of the underlying economics of IP transport to define a regulatory regime at this time.

I. Preventing Gaps in Universal Service

A. The Commission Cannot Abandon the Goal of Universal Service

Without explicitly acknowledging it, the NPRM proposes a radical break with the past. The mechanism proposed to provide for CAF funding to high cost areas would implicitly permit providers to abandon subscribers deemed too expensive to serve. For the first time in the Commission's history, the Commission proposes to replace the principle of "universal" with "close enough." The Commission must not embark on such a path.

Section 254 establishes a mandate to provide universal service. In order to make clear the inclusive scope of "universal," the phrase "all regions" appears in both Section 254(b)(2) and (b)(3). Of course, the "all regions" language predates the 1996 Act. In its own 1983 Decision and Order creating the Universal Service Fund, the Commission described its goal as ensuring that rates "are within the means of the average subscriber in all areas of the country, thus providing a foundation on which the states can build to develop programs tailored to their individual needs."¹

The language in the current NPRM abandons this goal of true universality. It seeks comment on a proposal to exclude a "small percentage of housing units" from the benefits of any universal service program.² Quite simply, adopting such a proposal would end the universality of the Universal Service Fund. While the President's goal of 98% high-speed wireless coverage is laudable, 98% cannot be the endpoint for universal

¹ In the Matter of Amendment to Part 67 of the Commission's Rules and Establishment of a Joint Board, *Decision and Order*, 96 FCC 2d 781 at ¶ 30 (1983).

² NPRM ¶ 134.

service.³ The Commission must establish policies that provide a mechanism for *all* regions to connect to broadband, not just *most* regions or even *almost all* regions.

B. The Cost of No Access to Broadband is High and Self-Perpetuating

The economics of broadband provisioning suggest that some percentage of American households will not be served under normal market conditions. This percentage, at least 8-10 percent by some estimates, are not excluded simply because it is not profitable to provision them.⁴ They are excluded because it is not profitable *enough* to provide them with service.⁵ For carriers, resources devoted to areas with low rates of return are resources that are not devoted to areas with higher rates of return. This is especially true for large, publicly traded carriers that feel compelled to deliver a high return on investment in order to justify stock prices.⁶

In seeking to connect those 8-10 percent of households left behind by the market, the Commission must not abandon some households simply because it is inconvenient to connect them. Broadband Internet access has become a basic necessity of modern life. It is an increasingly key part of bringing healthcare and education to hard to reach areas. While bringing broadband to an unserved area may not automatically generate jobs, the absence of broadband in an area is likely to reduce that area's ability to generate jobs in

³ President Barack Obama, *Remarks by the President on the National Wireless Initiative in Marquette, Michigan* (Feb. 10, 2011), available at <http://www.whitehouse.gov/the-press-office/2011/02/10/remarks-president-national-wireless-initiative-marquette-michigan>.

⁴ Gregory Rose, *Wireless Broadband and the Redlining of Rural America*, New America Foundation 3 (April 2010), available at http://newamerica.net/publications/policy/wireless_broadband_and_the_redlining_of_rural_america.

⁵ *Id.* at 12.

⁶ *Id.* at 12.

the future.⁷ In the words of one scholar, “[h]aving access to broadband, therefore, is simply treading water or keeping up. Not having it means sinking.”⁸ As the importance of broadband increases, the rate at which unserved areas sink will increase in kind.

C. The Award Process Will Likely Leave Households or Areas Unserved

By proposing that bid areas be as small as census blocks, the Commission enhances the possibility that many areas may receive no bids. With such a granular set of geographic areas, potential providers can easily choose not to bid on those blocks that face higher per-unit costs.⁹ The whole purpose of designating geographic areas with minimum service requirements within each is to ensure that provision of service to high-cost areas can be cross-subsidized by serving low-cost areas as well. Drawing too fine a grid on currently unserved areas defeats this purpose, and will only allow bidders to skim off provision to the most profitable of the unserved areas.

Even if larger geographic areas are designated for coverage, it seems clear that there will be units within those areas that will not be served. The Commission has stated that it may allow winning bidders to carve out a percentage of housing units that they deem too costly to serve.¹⁰ The Commission also suggests that bidders may be able to set their own standards for minimum coverage per area.¹¹ In either case, the baseline assumption seems to be that within particular areas, certain households—the highest of the high-cost—will not be served.

⁷ *Scholars’ Roundtable: The Effects of Expanding Broadband to Rural Areas*, Center for Rural Strategies, at 3-4 (April 2011).

⁸ *Id.* at 4.

⁹ Dennis Weller, *Auctions for Universal Service Obligations* 6, June 1998; Andrew Dymond & Sonja Oestmann, *Rural Telecommunications Development in a Liberalising Environment: An Update on Universal Access Funds* 5, July 2002.

¹⁰ NPRM ¶ 134.

¹¹ NPRM ¶ 334.

The ability of a winning bidder to cherry-pick lower-cost units within its own bid area provides little incentive for any provider to serve those housing units, undermining the purpose of designating specific bid areas ahead of time.

A further problem with allowing bidders to determine their own minimum service requirements is that doing so makes it extremely difficult to decide upon which bids have won. The bidder who agrees to provide service at the lowest per-unit cost will likely agree to serve fewer units total, requiring the Commission to reconcile bids that vary according to the two separate goals of low subsidy cost and high number of units served. Even should it decide to allow bidders some leeway to determine that certain housing units within an area will not be served, the Commission must set minimum standards for each area. Otherwise, bidders are not merely determining the price they will pay, but also what they are actually paying for.

This is not to suggest that the Commission should necessarily require all winning bidders to serve every last housing unit in each bid area. While the Commission should seek to minimize the number of unserved units, such a stringent requirement may, in certain areas, simply increase the number of areas receiving no bids, thus preventing even the relatively lower-cost units within the areas from receiving the benefits of connectivity.

However, there are mechanisms by which the Commission can ensure that very high-cost units have the ability to gain connection, by creating the regulatory structures necessary that will allow self-provisioning.

II. Provisioning Unserved Areas

The key to provisioning the hardest to reach areas is not to continually increase incentives for large carriers to provide barebones service in order to obtain even more universal service subsidies. Instead, those hardest to reach areas should be empowered to provision themselves through a right of interconnection and creation of a small grant fund to provide limited support for one-time purchases of equipment to “seed” the unserved areas.

The most practical way to achieve this connectivity in the hardest to reach areas is to adopt a self-provisioning model. This would allow communities not serviced by a USF recipient to provision their own connectivity. Relatively small policy decisions can dramatically increase the ability of unserved areas to economically self-provision broadband Internet access. Such policies will also highlight the importance of local communities in building broadband capacity, and may ultimately reduce the need to rely on the Fund in the future.

The key to fostering self-provisioning is to require Fund recipients to demonstrate an ability to interconnect with any willing broadband Internet access provider in the service area or from a surrounding area. In the case of self-provisioning, “broadband Internet access provider” must be interpreted broadly. Non-commercial organizations, in addition to willing individuals, and even local governments, must be allowed to connect with recipient networks. Such a broad scope of qualifying entities will give unserved areas maximum flexibility in designing and implementing an access scheme that best addresses local conditions.

A. Point of Interconnection

In order to maximize the likelihood that communities will not be left behind, the Commission must create interconnection standards. This uniform set of standards should effectively balance the needs of unserved areas to connect to existing networks with the recognition that existing networks may not be unable to economically accommodate every possible interconnection technology. Interconnection should be made available to applicants serving at least two types of areas.

First, the points must be available to applicants proposing to serve housing units within a served bid area but outside the scope of actual coverage. There are many instances, especially in rural and sparsely populated areas, where recipient networks will have a presence in a bid area that does not provide access to all households and businesses within that area. While recipient networks need not allow connectivity to duplicative networks, it is critical to provide a way for unserved household and businesses within a nominally covered area to access the network.

Second, recipient networks must offer network interconnection to applicants serving neighboring non-served areas. These areas, which qualified for inclusion in USF auctions but exited the auction without receiving successful bids, must be allowed to interconnect with adjacent recipient networks.

Once interconnection standards are established, it must be clear that recipient networks must make interconnection available on a reasonable basis. For example, the fact that satellite-based Internet access service is available in an area should not impact the ability of the area to take advantage of a right to interconnect.

All recipient organizations must be required, as a condition of receiving funds, to recognize this obligation and agree to provide points of interconnection. In the National Broadband Plan, the Commission recognized the critical role that access to backhaul capacity served in fostering competition.¹² Such access is also critical to providing local broadband Internet access in underserved areas.

B. Strengthening Local Initiatives Strengthens Broadband Access

The Commission should apportion a relatively small sum of money to support the purchase of necessary equipment for entities attempting to connect unserved areas. This funding would facilitate the one-time purchase of capital-intensive equipment needed to interconnect with existing recipient networks. It could be funded at levels similar to the now-defunct Technology Opportunities Program, which was \$45.1 million in FY 2001.¹³ This type of funding is especially likely to encourage local solutions to deployment.

Local support of deployment projects is a key element in a project's success.¹⁴ Local providers are tied to their community and often exist specifically to provide that community broadband access. An area nominally covered, but mostly ignored by a large company because it is too small to warrant attention, can be an important business opportunity for a local provider.¹⁵

¹² *Connecting America: The National Broadband Plan*, Federal Communications Commission, Chapter 4 (2010).

¹³ National Telecommunications and Information Administration FY 2001 Budget, available at <http://www.ntia.doc.gov/ntiahome/fy2001/>.

¹⁴ General Accounting Office, *Broadband Deployment Is Extensive through the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas*, GAO-06-426, at 4 (May 2006).

¹⁵ *The Story of Medicine Bow (Parts I-8)* (Jan 2010), <http://www.wirelesscowboys.com/?p=24>.

Similarly, rates of return that are prohibitively small for a national carrier with institutional stockholders to satisfy may satisfy the needs of smaller local businesses. Faced with the reality of limited investment capital and capacity, it is only logical for large carriers to focus on the comparatively profitable areas in their footprint. Unfortunately, this market dynamic means that underserved communities nominally within the coverage area of a large carrier will often remain underserved.¹⁶

Furthermore, the nature of most universal service funding schemes is that they create a disincentive to innovate or invest beyond the minimum standards needed to qualify for funding.¹⁷ Local ties to the community can help transform universal service funds from an excuse to provision an area into a launching pad for a badly needed local service.

Finally, local involvement in provisioning can help to increase demand for broadband Internet access. This is because, in addition to access, demand is a critical component to Internet adoption. In the National Broadband Plan the Commission itself recognized that in addition to cost, digital literacy and relevance are significant barriers to adoption and utilization.¹⁸

¹⁶ *Rural Broadband Principles and Policy Recommendations*, Rural Broadband Policy Group, at 3 (Aug. 2009), available at http://www.ruralstrategies.org/sites/all/files/tmp/Rural_Broadband_Principles_AUGUST_09.pdf.

¹⁷ Heather E. Hudson, *Defining Universal Service Funds*, Inter-Media Vol. 38, Issue 1 at 19 (March 2010).

¹⁸ *Connecting America: The National Broadband Plan*, Federal Communications Commission, Ch. 9 (2010).

Studies indicate that non-Internet users are less supportive of programs designed to expand Internet access.¹⁹ Half of these non-Internet users report that they do not think that online content is relevant to their lives.²⁰ At the same time, 60% report that they would need assistance to begin to use the Internet, and 50% do not know enough about computers and technology to start using the Internet on their own.²¹ All of these statistics point to a demand problem – many people who are not currently online do not understand what is available online or how they can access information available on the Internet.

Local involvement in provisioning can help to address that. Community-based projects help attract and build technical expertise in those communities.²² A core group of community members who possess a familiarity with computers and technology can become a beachhead for further adoption. In small communities – the type most likely to be left out of coverage areas – the presence of a handful of technically proficient individuals can significantly impact community education and awareness. Building this local capacity directly advances the goal of giving the public “meaningful access to broadband.”²³

C. Qualifying Projects

In order to provide maximum flexibility to connect unserved areas, the Commission should not limit interconnection to Section 214(e) Eligible

¹⁹ Aaron Smith, *Home Broadband 2010*, Pew Internet & American Life Project, at 17-19 (Aug. 2010).

²⁰ *Id.* at 10-11.

²¹ *Id.* at 3.

²² *Rural Broadband Principles and Policy Recommendations*, Rural Broadband Policy Group, at 4-5 (Aug. 2009), available at http://www.ruralstrategies.org/sites/all/files/tmp/Rural_Broadband_Principles_AUGUST_09.pdf.

²³ NPRM ¶124.

Telecommunications Carriers (ETCs). As the goal of this program would be to encourage self-provisioning, any individual, organization, or company that can demonstrate an ability to interconnect with recipient networks should be granted a right to do so.

Local governments should also be allowed to bid for funds. Rural broadband deployment is, in the words of the GAO, “often influenced by the extent of involvement and leadership exercised by local government and community officials.”²⁴ Commissioner Clyburn recently recognized the critical role that local government can play in filling deployment gaps left by existing service providers.²⁵

Such a targeted program directly advances the Commission’s obligation to accelerate the deployment of advanced telecommunications services under Section 706(b). The Commission has already concluded that broadband deployment is not reasonable and timely.²⁶ As such, it is appropriate to remove regulatory hurdles – such as ETC funding eligibility requirements – that form barriers to deployment in all regions.

Areas eligible for USF support but unserved by fund recipients are unquestionably areas where service deployment is not timely. Without further support, they will continue to remain unserved. Restricting interconnection to ETCs, which in

²⁴ General Accounting Office, *Broadband Deployment Is Extensive through the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas*, GAO-06-426, at 23 (May 2006).

²⁵ Commissioner Mignon L. Clyburn, *Statement by Commissioner Mignon L. Clyburn on Proposed Anti-Municipal Broadband Legislation*, (April 2011), available at http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0404/DOC-305530A1.pdf.

²⁶ In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act; A National Broadband Plan for Our Future, *Sixth Broadband Deployment Report*, 25 FCC Rcd. 9556, 9558 ¶ 2 (2010).

most cases will have already elected not to bid for USF funds to support servicing the area in question, would drastically undermine ability of a community to self-provision. Instead, these areas should be free to form organizations that meet local needs. As long as those organizations, or even individuals, are capable of meeting minimum requirements demonstrating the capability to interconnect with the network, they should be granted access to recipient networks.

D. Community Anchor Institutions

In order to further increase the likelihood of servicing unserved areas and to efficiently leverage USF dollars, the Commission must also eliminate restrictions on how community anchor institutions use their broadband Internet connections. The Commission should forbear from rules that currently prevent community anchor institutions from reselling broadband Internet access to unserved areas in search of interconnection.

For many unserved areas, the closest and most economical interconnection point is a community anchor institution. These schools, libraries, and medical facilities have already received funds to give them broadband Internet access. There is no reason that adjacent unserved areas should not be allowed access to this resource if it is the most convenient and logical interconnection point.

III. Minimum Standards For Fund Recipients

A. Reverse Auctions for CAF Awards May Establish Local Monopoly Carriers

The Commission proposes awarding CAF subsidies to a single bidder who has the lowest per-unit bid. Selecting only one winner has the advantage of preventing duplicative awards in each geographic area. However, as has been recognized for some

time, this reduction in the subsidy amount comes at a price of suppressing potential competition once a market is established.²⁷ Once a CAF grantee establishes service in a geographic area, other potential competitors for the area (who presumably estimated for themselves a higher cost for deployment than the grantee) will have little reason to enter a market that the grantee not only judged it could enter more efficiently, but for which only the grantee will have subsidy support.²⁸ In other words, the process of subsidizing only one provider per area will likely establish that winning provider as a local monopoly for at least the near future, discouraging potential entrants.

These drawbacks of the single-grant process are not necessarily fatal to its success. While a lack of competition in these markets could disincentivize later lowering of prices, deployment of faster speeds, or inclusion of additional services and features (such as multichannel video provision),²⁹ the Commission can ensure that certain public interests are met in several ways. For instance, as noted above, the Commission should prevent grantees from engaging in behavior that would limit further competition from emerging, by establishing requirements for interconnection, infrastructure-sharing with anchor institutions, and wholesaling. Furthermore, the Commission should affirmatively establish substantive public interest and service quality obligations.

B. Ensuring Minimum Non-Bitrate Standards

The substantive quality obligations of grantees should extend beyond merely providing minimum speeds. Section 254 sets forth principles to guide the disbursement of

²⁷ Paul Milgrom, *Procuring Universal Service: Putting Auction Theory to Work* 5, Dec. 9, 1996; Weller, *supra* note 9 at 8.

²⁸ Milgrom, *supra* note 27 at 5.

²⁹ *Id.*

USF funds.³⁰ Of relevance here, Section 254(b)(1) requires that services provided with USF funds should be “quality services” offered at “just, reasonable, and affordable rates,” and Section 254(b)(3) requires that fund recipients provide “advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.”

The NPRM asks whether the Commission should measure broadband service based on the speed offered,³¹ as well as whether “throughput, latency, jitter, and packet loss” should be used as additional metrics by which to measure recipients of universal service funding.³² While these are certainly important metrics, they are not enough to determine whether services are being provided on reasonable terms, or in ways comparable to those offered in urban areas. In addition to these considerations, carriers’ terms of service play a crucial role in consumers’ ability to use Internet access services and should be an important metric used to evaluate fund recipients.

In particular, the Commission should evaluate applicants for funding based on the following: (1) usage caps; (2) excessive use policies; (3) discrimination against particular applications; and (4) restrictions on device tethering. In doing so, the Commission should pay particular attention to the fact that while urban customers may have a choice of providers, residents of the areas served under the Commission’s proposed modifications to the high-cost fund will not have a choice because the Commission proposes to limit funding to unserved areas and to provide funds to a single provider in the area so

³⁰ 47 U.S.C. § 254(b).

³¹ NPRM ¶ 24.

³² NPRM ¶ 105.

served.³³

The Commission must therefore hold USF providers to a standard that ensures that those consumers served by fund recipients will have genuine, meaningful access to broadband that provides comparable services and benefits to those available in urban areas. As documented below, rural broadband subscribers often face highly restrictive terms of service that effectively foreclose meaningful use of broadband beyond limited services such as email. While providers often justify such draconian restrictions on the argument that “something is better than nothing,” the statutory principles of parity set forth in Section 254(b) compel the Commission to reject this argument. Where rural broadband is concerned, substandard overpriced service is a something worse than nothing. An applicant that pretends to meet speed standards by dramatically reducing the utility of the service should not receive federal funds.

The Commission should compare proposed service offerings by applicants not just to the terms stated by carriers, but to the levels of service actually provided in major urban areas by those providers competing for mass market customers. Specifically, the Commission should not permit wireless or satellite providers to argue that, simply because their terms of service are nominally consistent in both urban and rural areas, that they may impose highly restrictive terms in areas they serve with USF subsidies. While allowances should be made for differences in technology, the Commission should judge whether a service is “comparable” to that offered in urban areas based on its intended use. If a USF subsidy is given to provide the equivalent of primary fixed broadband to the home, the Commission should compare the proffered service to the most common fixed

³³ See NPRM ¶ 402.

broadband available to the home in urban areas: DSL and cable modem service. For the same reason, the Commission should not permit USF applicants to justify restrictive terms of service by comparison to a single discount provider or based on comparisons with uncompetitive markets.

Finally, Commenters note that if the Commission adopts the proposal in the NPRM to allow a subsidized provider to partner with another provider in providing the subsidized service,³⁴ the Commission must require the unsubsidized partner to meet the same standard for terms of service that is applied to the recipient of funds. To do otherwise would allow applicants to evade their responsibility under the USF principles to ensure that all Americans have access to telecommunications and information services on reasonably comparable terms. Anything less runs counter to the explicit instructions of Congress and subverts the principle of universality embodied in the Act.

i. Usage Caps

Most ISPs, wired and wireless, impose usage caps, restricting the amount of data a customer may use in any given month. For example, Comcast has in place a monthly data consumption cap of 250 GB.³⁵ AT&T recently imposed a cap of 150 GB per month for DSL, and 250 GB per month for its U-Verse service.³⁶ While usage caps have the potential to limit access, it would appear that, at least for the moment, usage caps in the 150-250 GB range are the norm for residential wireline service.

³⁴ See NPRM ¶ 282.

³⁵ Comcast Acceptable Use Policy for High Speed Internet, <http://www.comcast.com/Corporate/Customers/Policies/HighSpeedInternetAUP.html>.

³⁶ Engadget, “AT&T Will Cap DSL and U-Verse Internet, Impose Overage Fees,” March 13, 2011. Available at: <http://www.engadget.com/2011/03/13/atandt-will-cap-dsl-u-verse-internet-and-impose-overage-fees/>.

These restrictions on bandwidth usage escalate with mobile wireless ISPs, limiting use to 5 GB per month.³⁷ Recent studies show that the average Internet user generates over 14 GB per month of traffic, and that this number is steadily increasing.³⁸ To require rural users to subsist on a 5 GB cap for their primary broadband service cannot possibly be considered comparable to what is available for primary, non-mobile service in urban areas.

Satellite ISPs take these limitations further.³⁹ HughesNet, for example, not only imposes a daily limit on downloads of 200 MB.⁴⁰ As the HughesNet website itself warns, many activities considered basic to cable and DSL subscribers, such as downloading movies, streaming media, or using virtual private networks (VPNs), are “not recommended” for use with satellite broadband. Users who exceed the 200 MB cap, which the average urban user would exceed regularly, are subject to HughesNet’s “Fair Use Policy.” Under this policy, a user must wait until his capacity is “replenished” to enjoy the advertised speed – and use of the service for low-bandwidth activity while “replenishing” will delay the “replenishment” further.

As the National Broadband Plan notes, data usage rates among residential customers is rising at approximately 30% annually.⁴¹ National purposes envisaged by the

³⁷ Catherine Sandoval, *Preserving the Open Internet, Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, 5, (April 26, 2010), *available at* <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020442043>.

³⁸ Cisco Visual Networking Index: Usage Study (October 25, 2010). Available at: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/Cisco_VNI_Usage_WP.html.

³⁹ See Sandoval, *supra* note 37, at 5.

⁴⁰ Hughes Net, Plans and Pricing, <http://consumer.hughesnet.com/plans.cfm> (describing a download allowance of 200 MB for its basic Internet service).

⁴¹ Federal Communications Commission, *The National Broadband Plan* § 3.1, *available at* <http://www.broadband.gov/plan/3-current-state-of-the-ecosystem/>.

NBP— “advancing consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation, and economic growth” – are likely to require greater uses of bandwidth.⁴² The plan notes that these “national priorities should not be restricted by caps on bandwidth.”⁴³

Accordingly, the Commission should not allow recipients of USF to impose caps that thwart the ability of subscribers to use the service in the manner envisioned by the National Broadband Plan. After all, the *entire point* of modifying the USF to include broadband subsidies is to make the economic and civic benefits identified in the National Broadband Plan available to all Americans. It would be a cruel joke to provide billions of dollars for services that subscribers cannot use because of bandwidth cap limitations.

Relatedly, many ISPs retain policies that allow them to suspend accounts of customers who exceed their usage caps. For example, Comcast “reserves the right immediately to suspend or terminate [customer] Service account and terminate the Subscriber Agreement” if customers violate its acceptable use policy (AUP), including the usage cap of 250 GB per month.⁴⁴ Time Warner has reportedly terminated subscribers’ Internet access for excessive use.⁴⁵

⁴² Federal Communications Commission, *The National Broadband Plan*, 194, (March 2010), *available at*: <http://www.broadband.gov/plan/>.

⁴³ *Id.*

⁴⁴ Comcast Acceptable Use Policy for High Speed Internet, <http://www.comcast.com/Corporate/Customers/Policies/HighSpeedInternetAUP.html>

⁴⁵ Nate Anderson, *Even When Not Explicit, ISP Data Caps Still Haunt Users*, <http://arstechnica.com/tech-policy/news/2009/04/even-when-not-explicit-isp-data-caps-remain.ars>.

The Commission should carefully consider whether to allow USF recipients to include such terms. Unlike the providers discussed above, USF recipients provide service to vulnerable populations with few, if any, options for alternative providers. Fear of being cut off – especially in light of the extremely low capacity caps set by some providers discussed above – will discourage subscribers from using beneficial services or availing themselves of new economic, educational, or civic opportunities.

In view of the stifling effect usage caps are likely to have, the Commission should evaluate fund applicants based on their practice of imposing caps. At a minimum, the Commission should ensure that capacity matches average usage in urban areas. In addition, the FCC should evaluate how the cap would accommodate growth in usage over a period of time. Furthermore, exceeding the cap should never be grounds for suspending a user's account.

ii. Congestion Management Practices

Many ISPs maintain congestion management policies that affect the quality of their broadband Internet service. Yet these policies are not revealed to customers at the point of sale.⁴⁶ On the contrary, most ISPs, particularly wireless ISPs, advertise their services as providing “unlimited” access to the Internet and obscure their congestion management practices in acceptable use policies, which can only be accessed after clicking through several links on their websites.⁴⁷ These policies purport to limit bandwidth consumption, limit the applications a customer may use, and limit the devices a consumer may connect to a provider's network.

⁴⁶ Sandoval, *supra* note 37, at 15-25.

⁴⁷ *Id.*

For example, Comcast's acceptable use policy states that its network management activities may include "temporarily lowering the priority of traffic for users who are the top contributors to network congestion."⁴⁸ While the policy gives examples of types of applications that can contribute to network congestion, a customer has no way of knowing what would make her a "top contributor to network congestion."

The policy provides further:

You must also ensure that your use of the Service does not restrict, inhibit, interfere with, or degrade any other person's use of the Service, nor represent (as determined by Comcast in its sole discretion) an overly large burden on the network. In addition, you must ensure that your use of the Service does not limit or interfere with Comcast's ability to deliver and monitor the Service or any part of its network.⁴⁹

The consumer has no way to determine when her use would "restrict, inhibit, or interfere with" others' uses or amount to the other kinds of uses forbidden by Comcast. In addition, although Comcast advertises and offers an Internet access service capped at a data consumption of 250GB per month, a consumer may be a "top contributor to network congestion" even while consuming less than the advertised 250 GB per month.

These restrictions on use intensify with wireless service providers, many of whom advertise access to "unlimited" data services, only to quietly impose severe limits on bandwidth consumption, application usage, and content usage. For example, some Clearwire mobile Internet plans are designated as offering "unlimited" access.⁵⁰

⁴⁸ Comcast Acceptable Use Policy for High Speed Internet, <http://www.comcast.com/Corporate/Customers/Policies/HighSpeedInternetAUP.html>

⁴⁹ *Id.*

⁵⁰ Clear, *Packages*, <http://www.clear.com/packages> (the 4G Mobile and Clear Spot Package and the Nationwide 4G Mobile and Home Package both claim to provide unlimited data.).

However, the company's AUP reserves the right to reduce a customer's data rate during periods of congestion.⁵¹ Its AUP further provides:

Clearwire, therefore, will monitor both overall network performance and individual resource consumption to determine if any user is consuming a disproportionate amount of available resources and creating the potential to disrupt or degrade the Clearwire network or network usage by others. This process of monitoring both overall network performance and individual resource consumption is consistent with the description of the nature of the Service previously described in this AUP.⁵²

These ISP practices with respect to congestion management have several consequences: (1) Practices that advertise "unlimited" Internet access prominently or at point of sale and impose limitations on use through obscure AUPs deceive consumers and discourage broadband adoption. (2) Most AUPs that prevent excessive use do not provide customers with any means to comply with their terms. (3) As Prof. Sandoval notes, obscuring limitations of the service, particularly the ability to handle traffic volume, prevents service providers from competing based on actual service offered.⁵³

In order to be eligible for USF, the Commission should require broadband Internet service providers to reveal usage caps and other limitations on use at the point of sale. In addition, applicants must be required to clearly explain what constitutes excessive use. Finally, fund applicants must be required to disclose capacity constraints on their network and how many consumers the network would actually be able to service at the advertised speed.

⁵¹ Clearwire, *Acceptable Use Policy*, (effective June 9, 2010), <http://www.clearwire.com/legal/acceptable-use-policy>.

⁵² *Id.*

⁵³ Sandoval, *supra* note 37, at 7.

iii. Discrimination Against Particular Applications

ISPs discriminate against particular applications often on the basis that such applications are bandwidth intensive and cause network congestion. For example, AT&T's wireless data terms of service, ostensibly applicable to its iPhone, prohibit uses that cause "extreme network capacity issues" including peer-to-peer file sharing.⁵⁴ Similarly, Time Warner Cable, again based on a need to manage network congestion, reserves the right to "limit the number of p2p sessions a user may conduct at the same time."⁵⁵ Metro PCS's terms of service limit customers' use of its service to "(i) Internet browsing' (ii) email; and (iii) some intranet access" and prohibits "downloading movies using peer-to-peer ("P2P") file sharing services" and "redirecting television signals for viewing on Personal Computers" among other uses.⁵⁶

Although peer-to-peer file sharing has been vilified as an application that causes network congestion, a study by the deep packet inspection provider Sandvine found that web-browsing and "real-time entertainment" consumed more bandwidth in North America than peer-to-peer file sharing.⁵⁷ And although peer-to-peer applications are often accused of facilitating copyright infringement, many content providers use the technology to legally deliver their content.⁵⁸ Thus, the ISP practice of preferring or disadvantaging certain applications cannot always be justified based on claims that such

⁵⁴ AT&T, *Wireless Data Service Terms and Conditions*, http://www.wireless.att.com/cell-phone-service/specials/iPhone3G_ATT_terms.jsp#data.

⁵⁵ Time Warner Cable, *Terms and Conditions*, http://help.twcable.com/html/twc_misp_aup.html.

⁵⁶ Metro PCS, *MetroWeb Terms of Use*, http://www.metropcs.com/products/metroweb/terms_of_use.aspx

⁵⁷ See Sandoval, *supra* note 8, at 21.

⁵⁸ See e.g. *NBC Selects Pando Networks To Power TV Downloads*, (February 27, 2008), <http://www.pandonetworks.com/node/74>.

applications either cause network congestion or are used for illegal purposes. Even where applications consume significant bandwidth, the Commission has observed that network management practices that target particular applications pose risks to competition and are a threat to the open nature of the Internet.⁵⁹

Although the Commission's recent network neutrality order⁶⁰ provides some protection for consumers, the Commission should impose significantly greater protections in the context of USF. Not only is USF a voluntary program, it provides service to the most vulnerable populations who generally have no other choice of provider. The Commission should therefore expressly prohibit any discrimination against content or applications, and expressly prohibit any prioritization of services or content, regardless of whether such conduct would be permitted under the existing network neutrality rules.

iv. Restrictions on Device Tethering

At least one wireless ISP prevents its customers from tethering their smart phones to personal computers. Verizon Wireless states that “[c]ustomers who do not have dedicated Mobile Broadband devices cannot tether other devices to laptops or personal computers for use as wireless modems unless they subscribe to Mobile Broadband Connect.”⁶¹ Such restrictions on tethering limit how consumers are able to access the Internet. They prevent wireless service from acting as a substitute to wired service for

⁵⁹ Report and Order, *Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer to Peer Applications*, 23 FCCR 13,028, paragraphs 45-50, (2008).

⁶⁰ Report and Order, *In the Matter of Preserving the Open Internet*, 25 FCCR 17,905 (2010).

⁶¹ Verizon Wireless, *Mobile Broadband Terms & Conditions*, http://b2b.vzw.com/broadband/bba_terms.html.

Internet access. If wireless providers are allowed to claim the benefit of USF on the same terms as wired providers, the Commission should seek to ensure that these providers offer the same kind of service. Such a requirement becomes even more important in areas where the subsidized provider would be the only provider of service.

IV. The Commission Should Cautiously Reform ICC, and Seek Data on Developing Interconnection Issues

The Commission's decision to combine notice of proposed modifications to the intercarrier compensation (ICC) regime with proposed modifications of the USF high-cost fund reflects the reality that rural connectivity requires numerous subsidies. The Commission also rightly observes that the lengthy history of ICC has created a regime that lends itself to certain kinds of arbitrage, and which may no longer align with the real costs or purposes of the ICC regime. Nevertheless, the Commission must tread warily. Many local carriers that continue to provide valuable service rely on the existing ICC regime, and a too sudden a transition might create significant disruption and loss of service.

In addition, the Commission should take this opportunity to examine the underlying nature of Internet Protocol (IP) traffic, and how changes in the economics and IP transport will impact ICC and telecommunications generally. As the attached report by Dr. Gregory Rose demonstrates, the current structure of the IP transport market increasingly does not appear to lend itself to a bill-and-keep model – although bill-and-keep may produce the right result in some circumstances. Similarly, although analysis of IP transport under the two-sided market or n-sided market model appears promising, the information available to date does not provide a means to determine the appropriate ICC regime.

Many parties filing comments in the ICC proceeding focused on Verizon's negotiated rate with Bandwidth.com, and the \$.0007 termination fee established by their agreement. These parties have focused almost exclusively on whether the Commission should or should not exercise authority over the rate, without any regard to what metrics, policies, or cost information should be used to assess the rate. By contrast, parties have not generally focused on the ongoing dispute over rates for exchange of traffic between Comcast and Level 3, preferring to view that dispute as a network neutrality issue. Yet both the Verizon/Bandwidth.com agreement and the Comcast/Level 3 dispute go to the fundamental questions implicated in ICC: under what terms interconnection will take place, and what limits, if any, the Commission should impose on the negotiations for interconnection and termination of traffic.

As more traffic moves to IP, the Commission must abandon the artificial distinctions between Comcast/Level 3 and Verizon/Bandwidth.com. Instead, the Commission should use this ICC proceeding to create a safety net by asserting general authority to intervene in disputes if necessary, while developing basic principles that will ensure universal, affordable access to IP services. If the Commission fails to seize the opportunity to create a safety net now, it runs the risk that it will need to assert authority and develop principles in the context of crisis management. Rather than risk such uncertainty, the Commission should assert general authority now, while declining to impose specific regulations or framework.

A. The Commission Should Not Phase Out Rural Subsidies from ICC Without a Firm Plan to Offset Loss of Support

It is true that the current system of subsidizing voice service to high-cost areas is far from ideal and needs reform. As numerous commenters have documented, the

intercarrier compensation (ICC) system in particular is inefficient and prone to regulatory arbitrage.⁶²

But it is likewise true that “some high-cost, rural, insular, and Tribal areas ... lack a private sector business case to provide service at affordable rates....”⁶³ These areas require subsidy if the people who live in them are to have access to modern communications. Today, providers of communications services to rural and high-cost areas receive a variety of subsidies,⁶⁴ such as the high-cost fund and loans from the USDA. ICC functions as an off-the-books subsidy, as well, because government rules require some networks to fund others through the payment of mandatory fees.

The complicated and inconsistent nature of the subsidy that high-cost carriers currently receive makes it difficult to know how much money they really need.⁶⁵ Additionally, the current regulatory structure is full of disincentives that keep some carriers from upgrading their equipment, improving their networks, and lowering costs. But it is possible that if the revenues that some high-cost carriers currently receive from ICC are removed and not replaced, not only might broadband not be deployed on a timely basis to rural America, but basic telephone service might also be imperiled.

⁶² In addition to traffic simulation and phantom traffic issues, regulatory arbitrage currently allows interconnected VoIP providers to avoid paying ICC on an equal basis with other voice providers. For this reason, the FCC should determine that it possesses Title II authority over interconnected VoIP providers and set them on a glide path toward integration into the ICC system. *See* NPRM ¶¶ 73, 617.

⁶³ NPRM ¶ 559.

⁶⁴ *Cf.* NPRM ¶ 13.

⁶⁵ Admittedly, this works against the language of the 1996 Telecommunications Act, which directs the Commission “to make universal service support explicit, rather than implicitly included in interstate access rates.” *See* NPRM ¶ 222. But the Commission nevertheless recognizes that “ICC revenues today remain an implicit subsidy for certain carriers.” NPRM ¶ 43.

Large carriers that pay subsidies to smaller networks in the form of ICC fees complain, and rightly so, that in some instances those fees are being used for purposes other than making sure that rural Americans have good communications service.⁶⁶ But while those carriers acknowledge the subsidy function of ICC, they simply propose to phase it out, without considering that those funds might be necessary to achieve the goals of universal service.⁶⁷

The FCC must therefore be cautious. It may be the case that even after all of the meticulously cataloged waste, fraud and abuse in the ICC/USF system is eliminated, and after every high-cost carrier upgrades its network to more efficient equipment, that the subsidy function of ICC is still necessary to keep networks running. If this is true, then the subsidy cannot simply be discarded and replaced with nothing. Particularly in a time of constrained public finances and spending cuts—and a bipartisan commitment to capping the growth of the high-cost fund⁶⁸—it is not clear if the fund or its successor will be able to make up the difference. However baroque and difficult the system is to

⁶⁶ *See, e.g.*, Comments of Verizon and Verizon Wireless, WC Docket No. 10-90, Apr. 1, 2011, at 41.

⁶⁷ For example, whatever the merits of Verizon’s proposal to “prevent the cost of the uneconomic subsidies inherent in the current intercarrier compensation system from being extended to VoIP services and set a uniform low default rate for VoIP calls that will apply during any transition period adopted for legacy services,” Verizon Comments at 2, if subsidies to rural carriers begin to shrink as a result of a shift to VoIP without a rise in high-cost/CAF support (or cost savings on the part of rural carriers), their ability to operate, and the goal of universal service, could be imperiled. *Cf.* Statement of Commissioner McDowell, NPRM at 283 (“I have long advocated for comprehensive reform of the entire universal service and intercarrier compensation regimes. It’s like fixing a watch; it is impossible to tinker with one component of the mechanism without affecting all of its parts at the same time.”)

⁶⁸ *See* Statement of Chairman Genachowski, NPRM at 277 (a pillar of the NPRM is “Ensuring fiscal responsibility by controlling costs and constraining the size of the Fund”); Statement of Commissioner McDowell, NPRM at 282 (“I will work to ensure that we contain the growth of the fund, or preferably, reduce the size of the fund.”).

administer, it may better, in the case of voice traffic, to keep the current general ICC framework in place (with much-needed improvements to address specific abuses) than to phase it out entirely. It is true that an ICC system designed for a circuit-switched world is an uneasy fit in a packet-switched, all-IP future.⁶⁹ But the most important thing is to make sure that Americans living in high-cost areas have access to modern communications. This takes precedence over regulatory simplicity.

Thus, Commenters recommend that the Commission proceed gradually, by keeping the broad outlines of the current ICC system in place for voice traffic (even when “voice” traffic just refers to certain packets on an all-IP network), and adopting specific rules and enforcement mechanisms to address waste, fraud, and abuse, including regulatory arbitrage. This incrementalist approach is intended to keep a reforming zeal from pulling the rug out from under rural carriers who may depend on ICC revenue. Few people, given free rein to design and implement a universal service subsidy program, would make intercarrier payments an essential part of that program, and it is not sustainable for a network to charge one rate for some incoming traffic and a different rate for other incoming traffic (or to even be charged for that other traffic). For these reasons, when and if subsidies from other sources begin to make up for any lost, necessary ICC revenue, the FCC can begin to phase out the subsidy function of the ICC system. However, phasing out the subsidy function before these losses can be made up would endanger necessary support.

⁶⁹ NPRM ¶ 527.

B. The Commission Should Be Ready to Address Developing Network Interconnection Issues

The Commission seeks comment on “the long-term approach to intercarrier compensation reform” to ensure that it is “consistent with the exchange of traffic on an IP-to-IP basis.”⁷⁰ The transition to all-IP networks—where voice, video, and data traffic flows over the same pipes, on the same servers and interconnection points, using the same protocols—calls for a unified framework for the exchange of traffic between carriers. But due to the dynamic nature of networks, and changing technologies and business models, it is not clear that there can be just one simple system to regulate *all* intercarrier payments. Thus, except for gradual approach to voice traffic ICC reform advocated above, Commenters’ broader recommendation is that the Commission assert jurisdiction over traffic exchanges between carriers, while keeping its powers in reserve. At the same time, it should keep abreast of industry developments that may warrant specific interventions.⁷¹

⁷⁰ NPRM ¶ 527.

⁷¹ One such development is the ongoing dispute between Comcast and Level 3 about delivery of online video traffic. To reach Comcast’s 17 million broadband subscribers, an Internet company has no choice but to accede to Comcast’s terms. Given Comcast’s market power, and because most Comcast customers lack a viable alternative broadband provider to switch to if they are dissatisfied with their Internet video performance, it is possible that Comcast is merely rent-seeking by demanding higher fees from Level 3. The FCC should therefore formally investigate this and similar matters, and be prepared to act to protect consumers from the higher prices and degraded performance that could follow from market power abuses in interconnection.

Voice telecommunications networks have traditionally been required to interconnect—to exchange traffic with each other.⁷² Internet carriers, by contrast, have operated in a relatively regulation-free environment, and have been free to interconnect only pursuant to private deals, or to deny interconnection. While this has not always worked smoothly,⁷³ it has worked. On a packet-switched network with multiple redundant routes from A to B, any given interconnection failure or bottleneck could not threaten—at least for long—the Internet’s integrity. But increasing levels of concentration in some parts of the Internet—particularly in the last-mile, broadband access market (and the “middle mile” networks that are operationally linked to the last-mile networks), call into question whether it is wise to rely on an entirely deregulatory approach to Internet interconnection indefinitely. The stakes are higher now, and certain market actors have shown they are willing to leverage interconnection agreements to extract rents based on their privileged market position.

For many years, and driven by economics as well as improving technology, the business models prevalent among Internet carriers have been evolving. Large edge content providers interconnect directly with residential broadband networks. The role of “backbone” providers on the Internet has been lessened, leading to consolidation in that industry even as it seeks new business in delivering traffic that formerly could be delivered only on specialized “content delivery networks.” Most significantly, the level of competition in the last mile is very low. Often, a cable broadband access provider is

⁷² When carriers are denied the ability to deny interconnection with each other, regulators must adopt some system to determine payments between them, even if the rate is set at zero in a bill-and-keep regime.

⁷³ See James B. Speta, *A Common Carrier Approach to Internet Interconnection*, 54 Fed. Comm. L.J. 225 (2002) (noting almost 10 years ago that “[t]he Internet is rife with disputes over interconnection.”).

the only viable choice for Internet users who want to access high-bandwidth applications, such as streaming video. Given the evolving and unstable nature of Internet interconnection, the Commission should formally determine that it possesses the authority to resolve interconnection problems⁷⁴ that threaten consumers' ability to access the entire Internet, while keeping a close eye on marketplace developments that may ultimately harm consumers.

Public policy demands interconnection so that “universal service”—in the original meaning of the term—can be achieved.⁷⁵ The nation benefits from having one unified communications network, where any user can communicate with any other. But in an unregulated environment—one with no interconnection requirement or intercarrier payment system—whether any two networks exchange traffic with each other, and on what terms, depends on what deal they may come to. While interconnecting networks generally both benefit from interconnecting, any payment between carriers depends on whether one network needs the other more, and is willing to pay, and whether the other network is willing to deny interconnection if its payment demands are not met. Without a requirement of interconnection, networks users have no guarantee of stable, “universal” service.

Absent regulation, payments between carriers would not depend on what role each plays in the network (e.g., originator, transporter, or terminator of traffic), the

⁷⁴ Including merely technical ones: some backstop authority could be helpful in coordinating the transition to IPv6, for instance.

⁷⁵ See MILTON MUELLER, *UNIVERSAL SERVICE : COMPETITION, INTERCONNECTION AND MONOPOLY IN THE MAKING OF THE AMERICAN TELEPHONE SYSTEM* 4 (1998).

“balance” of traffic between networks,⁷⁶ or underlying costs.⁷⁷ Neither would they reflect costs borne or benefits gained by an interconnection.⁷⁸ Rather, they would depend entirely on the relative bargaining strength of the networks involved. This dynamic leads to another shortcoming of an unregulated interconnection regime: it favors large networks over small ones, and even monopoly networks over networks in competitive markets. (This dynamic may already be at play, helping explain the increase in consolidation in all parts of the network.) The problems of market power, consumer lock-in, and related issues are already so pervasive in the communications market that public policy should seek to avoid them; some level of Internet interconnection oversight may accomplish this.

⁷⁶ Is true that when Internet backbone transit providers interconnect, amount and flow of traffic is a good proxy for relative benefit—but it is incorrect to extrapolate from this that rough traffic balance is a prerequisite for all settlement-free interconnection. (Networks that voluntarily exchange traffic settlement-free are not operating in a “bill-and-keep” environment, as Commenters understand it. A bill-and-keep regime is one of mandated interconnection, where traffic is exchanged settlement-free regardless of mutual benefit.) For example, traffic will rarely be “balanced” when a network that carries Internet content interconnects with a last-mile broadband network, whose users tend to consume that content. But it may be that both networks benefit from this unequal traffic flow.)

⁷⁷ See Rudolph van der Berg, *How the ‘Net works: An Introduction to Peering and Transit*, *Ars Technica*, Sep. 2009:

Peering’s costs lie in the switches and the lines necessary to connect the networks; after a peering has been established, the marginal costs of sending one bit are zero... It’s a common misconception that the benefit an ISP derives from peering depends upon the direction of the flow of traffic. According to this way of thinking, if YouTube peers with an ISP, this benefits YouTube more than it does the ISP (since YouTube sends so much data but receives comparatively little). But in practice, the flow of traffic is not an issue for an interconnect. Whether it goes to or from the network, companies still need the same Cisco equipment.

; see also FCC, Intercarrier Compensation,

<http://www.fcc.gov/wcb/ppd/IntercarrierCompensation> (“the same or similar facilities are used to originate, terminate and transport all types of traffic.”).

⁷⁸ As Weiser and Nuechterlein write, “there is ... no reason to suppose that the equilibrium point in any given game of brinksmanship will lead to efficient, cost-based rates for termination.” JONATHAN E. NUECHTERLEIN AND PHILIP J. WEISER, *DIGITAL CROSSROADS* 314 (MIT Press Paperback ed. 2007).

However, it is not clear that there can be a single approach to intercarrier regulation. Most interconnections could be left unregulated. For others that are more competitively problematic (such terminating access on a large residential broadband network) a bill-and-keep approach may be both the simplest and fairest way to keep market power abuses in check. In still other contexts the online equivalent of “calling party pays” may be appropriate. Thus, while Commenters recommend that the Commission establish its backstop authority to prevent interconnection problems from imperiling consumers, it should begin to analyze the pros and cons of different regulatory and deregulatory approaches to interconnection in all parts of the network, including traditionally deregulated Internet interconnections. Differential treatment of voice IP traffic versus other traffic may be pragmatically necessary in the short term, but in the long term, bits are bits, and the Commission must adapt to an all-IP future.

CONCLUSION

In reforming the scope and methods of providing universal communications and information service to America, the Commission should not lose sight of the need that these services should ultimately be truly universal. Where auctions leave particular bid areas or sections of bid areas still unserved, regulatory structures should be put in place to allow communities to provision themselves. In setting standards for coverage, the Commission should ensure that providers will meet minimum standards not only for speed, but for just, reasonable, and non-discriminatory terms of service. Finally, the Commission must act cautiously in reforming ICC and be ready to address developing network interconnection issues.